

REMARKS

The present invention relates to a method of treating a patient suffering from a brain or spinal cord injury or neurodegenerative disease using bone marrow stromal cells.

Claims 1 and 4 have been amended herein to more particularly point out and distinctly claim the subject matter which Applicants regard as their invention. Applicants have also added new claims 5-14. No new matter has been added by way of these amendments as more fully discussed below. Accordingly, claims 1-14 are pending and under consideration following entry of the present Amendment.

Support for amendments to claims 1 and 4 and new claims 5-14

Applicants assert that the as-filed specification amply supports the amendment to claims 1 and 4 with respect to the fact that the cells are administered to a central nervous tissue adjacent to an impaired nervous tissue of the patient in order to activate endogenous stem cells in the brain to differentiate into parenchymal cells. Support for the amendment to claims 1 and 4 is found in the first two paragraphs of page 6. As such, no new matter has been added by way of this amendment.

Support for claim 5 for administering the cells into a penumbral tissue is found in the last paragraph of page 6.

Support for claim 6 for administering the cells into an ischemic boundary zone (IBZ) is found throughout the specification, for example in the Examples.

Support for claim 7 for intravascular administration of the cells is found in the first paragraph of page 7.

Support for claim 8 for direct transplantation of the cells into a central nervous tissue is found in Examples by way of intracerebral and intracranial transplantation.

Support for claim 9 for a brain tissue is found throughout the specification, for example in the last paragraph of page 7.

Support for claim 10 for spinal cord tissue is found in the Examples where treatment of spinal cord injury is disclosed.

Support for claims 11 and 12 for the administration of the cells adjacent to a lesion is found in the last paragraph of page 6.

Support for claims 13 and 14 for stroke and Parkinson's disease is found in the last paragraph of page 3.

Applicants respectfully submit that new claims 5-14 are fully supported by the specification as filed, and that claims 5-14 do not constitute new matter.

Rejection of claims 1-4 pursuant to 35 U.S.C. §102(b)

The Examiner has maintained his rejection of claims 1-4 under 35 U.S.C. § 102(b) as being anticipated by Azizi et al. (1998, PNAS 95:3908-3913). Specifically, the Examiner contends that Azizi teaches administration of bone marrow stromal cells to a mammal and therefore the cells of Azizi would inherently function to treat a patient suffering from a neurodegenerative disease. The Examiner asserts that although Azizi transplants the cells into a healthy brain, the mechanism of action of the cells is an inherent property. Therefore, the Examiner reasons that the teachings of Azizi render the present invention anticipated. Applicants disagree for the following reasons.

It is hornbook law that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” MPEP §2131 (quoting *Verdegaal Bros. v. Union Oil Co. of Calif.*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)). “The identical invention must be shown in as complete detail as is contained in the . . . claim.” *Id.* (quoting *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) (emphasis added)). Therefore, Azizi must describe each and every element of claims 1-4 in order to anticipate these claims under 35 U.S.C. §102(b), and this reference does not satisfy this requirement.

Applicants respectfully assert that Azizi cannot anticipate the present invention as encompassed by the claims because Azizi merely teaches engraftment and migration of bone marrow stromal cells following transplantation into a healthy brain. The Examiner has overlooked the aspect that the microenvironment of healthy brain is in fact very different from the microenvironment of a “damaged” brain. Applicants contend that the Examiner’s statement, “...the mechanism of action of these migrated cells is an inherent property of these cells, not a condition of brain”, is erroneous. It is the interaction of MSCs with the “damaged” brain that amplifies the neurorestorative properties in brain. The presence of injury is a necessary condition for the MSCs to evoke a response. Cells administered to normal brain do not alter

brain; it is the microenvironment of the injured brain that induces the administered MSC to function in a therapeutic manner. As such, the statement by the Examiner regarding, “[the cells] would function in the same way regardless of the condition of brain,” is unjustified and conflicts with the observation that MSCs produce factors (cytokines and growth factors) that promote repair and plasticity of the brain.

The present invention relates to a method of administering MSCs to a damaged brain to stimulate endogenous restoration or neurological function. The administered MSCs activate the endogenous stem cells in the brain, the ependymal cells, to proliferate and to differentiate into parenchymal cells including neurons. The cells are useful in promoting repair and plasticity of the damaged brain.

The claims have been amended herein to reflect an aspect of the invention relating to the specific site of injection. That is, the invention relates to the discovery that a tissue that is adjacent to an impaired nervous tissue provides a receptive environment for the MSCs to provide a therapeutic outcome (see last paragraph on page 6). As such, the claims have been amended to indicate that the cells are administered to a site that is adjacent to the impaired nervous tissue. For example, the MSCs can be transplanted into the penumbral tissue (see last paragraph on page 6). Further, Example 1 teaches administering the cells to the ischemic boundary zone.

Applicants respectfully submit that claims 1-4 are not anticipated by Azizi et al. for the reasons set forth above, and request reconsideration and withdrawal of the rejection pursuant to 35 U.S.C. §102(b).

Summary

Applicants respectfully submit that each rejection of the Examiner to the claims of the present application has been overcome or is now inapplicable, and that claims 1-14 are now in condition for allowance. Applicants further submit that no new matter has been added by way of the present amendment. Reconsideration and allowance of these claims is respectfully requested at the earliest possible date.

Respectfully submitted,

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Enclosures: RCE
Petition for extension of time
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